











**Modular optical transceiver**

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<b>Inventor(s):</b>	DALLESASSE JOHN [US]; WACHTEL PAUL [US]; LANE BRETT [US]; MCCALLUM DAVID S [US]; WHITEHEAD THOMAS [US]; ANDREI BOGDAN [US]; RICHARDSON DEAN [US]; NOBLE BRYAN [US]; MORETTI ANTHONY [US]; SCHEIBENREIF JOSEPH [US]		SG143283 (A1)
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<b>Applicant(s):</b>	EMCORE CORP [US]		
<b>Classification:</b>			more >>
<b>- international:</b>	<i>H04B10/02; G02B6/42; H01S5/022; H04B10/24; H04J14/02; H05K7/20; H04B10/02; G02B6/42; H01S5/00; H04B10/24; H04J14/02; H05K7/20; (IPC1-7): G02B6/42; H04B10/24; H04J14/02</i>	<b>Cited documents:</b>	
<b>- European:</b>	G02B6/42C3; G02B6/42D; H04B10/24A1; H04J14/02		WO0152454 (A1)
<b>Application number:</b>	EP20040017693 20040727		US4441181 (A)
<b>Priority number(s):</b>	US20030490448P 20030728; US20030491188P 20030730; US20030490450P 20030728; US20030491192P 20030730		XP002296738 (A)
			XP002296739 (A)
			XP002296740 (A)

**Abstract of EP 1503232 (A2)**

An optical transceiver (100) converting and coupling an information-containing electrical signal with an optical fiber including a housing (102) conforming to the industry standard XENPAK<sup>®</sup>; form factor including an electrical connector for coupling with an external electrical cable or information system device and for transmitting and/or receiving an information-containing electrical communications signal, and a fiber optic connector (124,126,128,130) adapted for coupling with an external optical fiber for transmitting and/or receiving an optical communications signal.; At least one electro-optical subassembly (110) is provided in the housing for converting between an information-containing electrical signal and a modulated optical signal corresponding to the electrical signal, along with a modular, interchangeable communications protocol processing printed circuit board (112) in the housing for processing the communications signal into a predetermined electrical or optical communications protocol, such as the IEEE 802.3ae 10 Gigabit BASE LX4 physical layer.

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## EUROPEAN PATENT APPLICATION

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(71) Applicant: **Emcore Corporation**  
**Somerset, NJ 08873 (US)**

(72) Inventors:  
• **Dallessasse, John**  
**Geneva, IL 60134 (US)**  
• **Wachtel, Paul**  
**Arlington Heights, IL 60005 (US)**  
• **Lane, Brett**  
**West Mont, IL 60559 (US)**

- **McCallum, David S.**  
**West Chicago, IL 60185 (US)**
- **Whitehead, Thomas**  
**Chicago IL 60610 (US)**
- **Andrei, Bogdan**  
**Lisle IL 60532 (US)**
- **Richardson, Dean**  
**Wilmette IL 60091 (US)**
- **Noble, Bryan**  
**Oswego IL 60543 (US)**
- **Moretti, Anthony**  
**Saint Charles IL 60175 (US)**
- **Scheibenreif, Joseph**  
**Oswego IL (US)**

(74) Representative: **Wagner, Karl H., Dipl.-Ing.**  
**WAGNER & GEYER**  
**Patentanwälte**  
**Gewürzmühlstrasse 5**  
**80538 München (DE)**

(54) **Modular optical transceiver**

(57) An optical transceiver (100) converting and coupling an information-containing electrical signal with an optical fiber including a housing (102) conforming to the industry standard XENPAK™ form factor including an electrical connector for coupling with an external electrical cable or information system device and for transmitting and/or receiving an information-containing electrical communications signal, and a fiber optic connector (124,126,128,130) adapted for coupling with an external optical fiber for transmitting and/or receiving an optical communications signal. At least one electro-op-

tical subassembly (110) is provided in the housing for converting between an information-containing electrical signal and a modulated optical signal corresponding to the electrical signal, along with a modular, interchangeable communications protocol processing printed circuit board (112) in the housing for processing the communications signal into a predetermined electrical or optical communications protocol, such as the IEEE 802.3ae 10 Gigabit BASE LX4 physical layer.

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## EUROPEAN SEARCH REPORT

Application Number  
EP 04 01 7693

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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Y	* pages 7,11; figures 1a,1b,2a,2b,5b,7 *  * page 13 - page 17 * * page 25, line 13 - line 27 * * page 6, line 4 - line 16 * -----	5-7,16,17	H04B10/24
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3 <del>The present search report has been drawn up for all claims</del>			
Place of search Berlin		Date of completion of the search 5 October 2004	Examiner Andreassen, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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# EUROPEAN SEARCH REPORT

Application Number  
EP 04 01 7693

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
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			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
<p><del>The present search report has been drawn up for all claims</del></p>			
Place of search		Date of completion of the search	Examiner
Berlin		5 October 2004	Andreassen, J
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons</p> <p>&amp; : member of the same patent family, corresponding document</p>			

EPO FORM 1503 03 82 (204C01)



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Application Number

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### CLAIMS INCURRING FEES

The present European patent application comprised at the time of filing more than ten claims.

☐ Only part of the claims have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims and for those claims for which claims fees have been paid, namely claim(s):

☐ No claims fees have been paid within the prescribed time limit. The present European search report has been drawn up for the first ten claims.

### LACK OF UNITY OF INVENTION

The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

see sheet B

☐ All further search fees have been paid within the fixed time limit. The present European search report has been drawn up for all claims.

☐ As all searchable claims could be searched without effort justifying an additional fee, the Search Division did not invite payment of any additional fee.

☐ Only part of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the inventions in respect of which search fees have been paid, namely claims:

☒ None of the further search fees have been paid within the fixed time limit. The present European search report has been drawn up for those parts of the European patent application which relate to the invention first mentioned in the claims, namely claims:

1,2,5-7,9,10,16-18



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LACK OF UNITY OF INVENTION  
SHEET B

Application Number  
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The Search Division considers that the present European patent application does not comply with the requirements of unity of invention and relates to several inventions or groups of inventions, namely:

1. claims: 1,2,5-7,9,10,16-18

An electro-optical wavelength-division-multiplexer wherein the the individual laser beams are guided to the multiplexer via a plurality of optical fibers which are mounted onto a flexible substrate (claim 5)

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2. claims: 3,4,8,15

An electro-optical wavelength-division-demultiplexer wherein the output beams from the multiplexer are focussed onto a photodiode array disposed on a printed circuit board (claim 8)

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3. claims: 11-14

An electro-optical transceiver comprising interconnected interchangeable subassemblies in order to allow a modular configuration of the transceiver (claim 14)

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 04 01 7693

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.  
The members are as contained in the European Patent Office EDP file on  
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

05-10-2004

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